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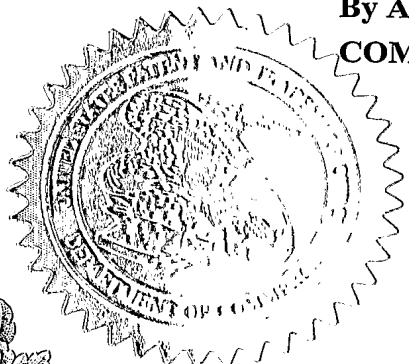
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APPLICATION NUMBER: 60/570,535

FILING DATE: May 13, 2004

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16698 U.S. PTO

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**PROVISIONAL APPLICATION FOR PATENT COVER SHEET**

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c).

Express Mail Label No. \_\_\_\_\_

INVENTOR(S)					
Given Name (first and middle [if any])		Family Name or Surname		Residence (City and either State or Foreign Country)	
ELAN		ZIV MD		RAMAT GAN ISRAEL	
Additional inventors are being named on the _____ separately numbered sheets attached hereto					
TITLE OF THE INVENTION (500 characters max)					
MULTI DIMENSIONAL FLEXIBLE MIDURETHRAL SUPPORT DEVICE FOR PREVENTION OF URINARY INCONTINENCE IN FEMALES					
Direct all correspondence to: CORRESPONDENCE ADDRESS					
<input type="checkbox"/> Customer Number: _____					
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<input type="checkbox"/> Firm or Individual Name		ELAN ZIV MD			
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ENCLOSED APPLICATION PARTS (check all that apply)					
<input type="checkbox"/> Specification Number of Pages		8		<input type="checkbox"/> CD(s), Number _____	
<input type="checkbox"/> Drawing(s) Number of Sheets		7		<input type="checkbox"/> Other (specify) _____	
<input type="checkbox"/> Application Data Sheet. See 37 CFR 1.76					
METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT					
<input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27.				FILING FEE Amount (\$)	
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[Page 1 of 2]

Respectfully submitted,

SIGNATURE

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+972-52-356928

Date

30.4.04

REGISTRATION NO.

(if appropriate)

Docket Number:

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**FEE TRANSMITTAL**  
**for FY 2004**

Effective 10/01/2003. Patent fees are subject to annual revision.

☒ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT

(\$ 80

**Complete if Known**

Application Number

Filing Date

MAR 15 2004 May 11 2004

First Named Inventor

Dr Elan Ziv

Examiner Name

Art Unit

Attorney Docket No.

**METHOD OF PAYMENT (check all that apply)**☐ Check ☐ Credit card ☒ Money Order ☐ Other ☐ None☐ Deposit Account:Deposit  
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☐ Charge fee(s) indicated below ☐ Credit any overpayments☐ Charge any additional fee(s) or any underpayment of fee(s)☐ Charge fee(s) indicated below, except for the filing fee to the above-identified deposit account.**FEE CALCULATION****1. BASIC FILING FEE**

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
1001 770	2001 385	Utility filing fee	
1002 340	2002 170	Design filing fee	
1003 530	2003 265	Plant filing fee	
1004 770	2004 385	Reissue filing fee	
1005 160	2005 80	Provisional filing fee	80
<b>SUBTOTAL (1)</b>			<b>(\$ 80)</b>

**2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE**

Total Claims	Extra Claims	Fee from below	Fee Paid
Independent	-20** =	X	
Multiple Dependent	-3** =	X	

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description
1202 18	2202 9	Claims in excess of 20
1201 86	2201 43	Independent claims in excess of 3
1203 290	2203 145	Multiple dependent claim, if not paid
1204 86	2204 43	** Reissue independent claims over original patent
1205 18	2205 9	** Reissue claims in excess of 20 and over original patent

**SUBTOTAL (2)**

(\$)

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**FEE CALCULATION (continued)****3. ADDITIONAL FEES**

Large Entity Small Entity

Fee Code (\$)	Fee Code (\$)	Fee Description	Fee Paid
1051 130	2051 65	Surcharge - late filing fee or oath	
1052 50	2052 25	Surcharge - late provisional filing fee or cover sheet	
1053 130	1053 130	Non-English specification	
1812 2,520	1812 2,520	For filing a request for ex parte reexamination	
1804 920*	1804 920*	Requesting publication of SIR prior to Examiner action	
1805 1,840*	1805 1,840*	Requesting publication of SIR after Examiner action	
1251 110	2251 55	Extension for reply within first month	
1252 420	2252 210	Extension for reply within second month	
1253 950	2253 475	Extension for reply within third month	
1254 1,480	2254 740	Extension for reply within fourth month	
1255 2,010	2255 1,005	Extension for reply within fifth month	
1401 330	2401 165	Notice of Appeal	
1402 330	2402 165	Filing a brief in support of an appeal	
1403 290	2403 145	Request for oral hearing	
1451 1,510	1451 1,510	Petition to institute a public use proceeding	
1452 110	2452 55	Petition to revive - unavoidable	
1453 1,330	2453 665	Petition to revive - unintentional	
1501 1,330	2501 665	Utility issue fee (or reissue)	
1502 480	2502 240	Design issue fee	
1503 640	2503 320	Plant issue fee	
1460 130	1460 130	Petitions to the Commissioner	
1807 50	1807 50	Processing fee under 37 CFR 1.17(a)	
1808 180	1808 180	Submission of Information Disclosure Stmt	
8021 40	8021 40	Recording each patent assignment per property (times number of properties)	
1809 770	2809 385	Filing a submission after final rejection (37 CFR 1.129(a))	
1810 770	2810 385	For each additional invention to be examined (37 CFR 1.129(b))	
1801 770	2801 385	Request for Continued Examination (RCE)	
1802 900	1802 900	Request for expedited examination of a design application	

Other fee (specify)

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**SUBTOTAL (3)**

(\$)

**SUBMITTED BY**

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Date

March 14, 2004

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## **MULTI-DIMENSIONAL FLEXIBLE MIDURETHRAL SUPPORT DEVICE FOR PREVENTION OF URINARY INCONTINENCE IN FEMALES**

The present invention relates generally to the field of treatment of urinary incontinence in female patients. More specifically, the present invention relates to a disposable device for use in the treatment of urinary incontinence in women. The invention describes a vaginal disposable device which is inserted and removed in a no-self-touch technique, by the patient herself, using a disposable applicator.

**Inventor:** Dr Elan Ziv, MD OBGYN, Urogynecologist

### **Background of the Invention**

Urinary incontinence is a widespread problem among females. It is estimated that up to 50% of women occasionally leak urine involuntarily, and that approximately 25% of woman will seek medical advice at some point in order to deal with the problem. Stress incontinence, the most common type of urinary incontinence, refers to the involuntary loss of urine resulting from abdominal pressure rise, occurring during exercise, coughing, sneezing, laughing, etc. When stress incontinence occurs, it is usually the result of the abnormal descent of the urethra and bladder neck below the level of the pelvic floor.

While many different factors may contribute to the development of stress incontinence, it is most prevalent among women ages 35-65 and those who have had multiple vaginal deliveries. Stress incontinence is both aggravating and unpleasant for women, and it can also be embarrassing. Many women wear sanitary pads or diapers in order to deal with incontinence, though this is not a real solution to the problem and it can be very inconvenient and unreliable. Surgical treatment may involve securing the paraurethral tissues to the periosteum of the pubic bone or the rectus facia in order to elevate the bladder neck above the pelvic floor and thereby distribute pressure equally to the bladder, the bladder neck, and the mid-urethra. Recently, a procedure known as "TVT" ("Tension Free Vaginal Tape") was developed, in which a mesh tape is implanted underneath mid-urethra, creating a hammock on which the urethra may kink during physical effort.

However, surgery is only suitable for severe cases, and the majority of women experiencing incontinence do not need surgical solutions.

One modality of non-surgical treatment involves the use of devices that are inserted into the vagina, either by a medical practitioner or by the woman herself. Most devices are designed to apply pressure against the bladder neck so as to inhibit or completely block the flow of urine through the urethra. A variety of such devices are known in the art. For example, refer to U.S. Patent No. 5,618,256 to Reimer, entitled, "Device for Arrangement in the Vagina for Prevention of Involuntary Urination with Females and an Applicator for use in Insertion of the Device;" U.S. Patent No. 5,785,640 to Kresch, entitled "Method for Treating Female Incontinence;" U.S. Patent No. 4,920,986 to Biswas, entitled, "Urinary Incontinence Device;" U.S. Patent 5,417,226 to Juma, entitled, "Female Anti-Incontinence Device;" U.S. Patent No. 5,386,836 to Biswas, entitled, "Urinary Incontinence Device;" and U.S. Patent No. 5,007,894 to Enhorning, entitled, "Female Incontinence Device."

The existing non-surgical incontinence devices suffer from numerous drawbacks:

- A number of devices are constructed so as to completely block the urethra and thus they need to be removed or collapsed in order to allow the woman to urinate, an inconvenience for the woman wearing the device.
- To overcome this drawback, vaginal devices have been developed having specialized shapes that do not completely block the bladder neck. These devices tend to be large, uncomfortable, and intrusive. They also tend to cause irritation or soreness to the vagina.
- Such devices are expensive to manufacture, and therefore, they are designed to be reusable and/or to remain in the vagina for an extended period of time. Such devices are normally made from large bodies of resilient material, such as plastic or hard rubber, in order to preserve their functioning for the required amount of time.
- Most devices known in the art also tend to be difficult or painful to insert and/or remove. In order to correctly inhibit urine flow, the device needs to be properly positioned in the vaginal canal. As stated previously, a doctor may be required to properly position the device.

"Multi-dimensional flexible midurethral support device for prevention of female urinary incontinence"

Dr Elan Ziv, MD OBGYN, Urogynecologist

Page 2 of 8

- In cases where a doctor has to insert the device, the device is adapted for remaining in the vagina for a prolonged period of time. When positioned in the vagina for an extended period of the time, the device may cause vaginal infections, necrosis, or bleeding.

- 5 • The device may block or inhibit the flow of normal body secretions through the vagina, and may cause inflammation of the vagina and a foul-smelling discharge.
- In cases where the device is designed to be inserted by the woman herself, the device often has to be removed, cleaned, and then re-inserted after a predetermined number of hours.

10

All vaginal devices so far described or marketed have at least one of the limiting features described above. No vaginal device for controlling urinary incontinence has so far been successfully marketed and used by the woman herself. There is a need for a device for controlling involuntary urination that is disposable, easy and comfortable for a woman to

15 use, that works effectively and reliably, and that is completely sanitary and hygienic.

### **The Invention**

The present invention provides a device for the treatment of urinary incontinence females. The device of the present invention is adapted to be disposable, worn only for a maximum of 16 hours and then discarded and replaced with a new device (if needed).

5 The device of the present invention is simple and easy to use, and is inserted effortlessly in the same user-friendly and familiar manner that a tampon is inserted into the vagina during menstruation. As opposed to large and intrusive devices of the prior art, the device of the present invention is comfortable, and, once inserted, the woman need not think about it again until it is removed.

10 When involuntary urination occurs, it is usually the result of the abnormal descent of the bladder neck and the urethra into a low position, away from the intra-abdominal pressure system. This "hypermobility" is the result of some injury to the support mechanism which normally keeps the urethra and the bladder neck in a raised position, along the backside of the pubic bone. The lowering of the bladder neck and the urethra that occur,  
15 for example, when a woman coughs, sneezes, or laughs, causing involuntary leakage of urine. The device of the present invention is designed so as to provide a "cradle" or shelf-like support to the urethra whenever the urethra descends momentarily, so as to prevent the leakage of urine. The device does not put pressure against the urethra or the bladder neck, but only provides support when there is a rise in abdominal pressure.

20 The present invention relates to a disposable device for the prevention of involuntary urination in females, adapted for being inserted into the vagina, comprising;

(a) an internal support structure

(b) a cover covering said internal support structure and comprised of a flexible  
25 material, and;

(c) an applicator coupled to the internal support structure and the cover for facilitating insertion of the device into the vagina;

The main device and the cover are adapted for forming a cradle support for the mid-urethra following insertion of the device into the vagina so as to prevent involuntary  
30 urination while allowing for voluntary urination.



The invention will now be described with reference to accompanying drawings:

FIG. 1A is a side view of the internal support structure.

FIG. 1B is a top view of the internal support structure

FIG. 1C is a perspective view of the internal support structure

5 FIG. 2A is a side view of the extender.

FIG. 2B is a top view of the extender

FIG. 2C is a perspective view of the extender

FIG. 3A is a sectional side view of the internal support structure at rest

FIG. 3B is a sectional side view of the extended internal support structure

10 FIG. 4A is a perspective view of the covering

FIG. 4B is a perspective view of the main device inside the covering.

FIG. 5 is a perspective view of the applicator.

FIG. 6 is a sectional view of the invention within the applicator

FIG. 7 is a side view of the female pelvis.

15

The core of the device is a one prolonged embodiment (FIG 1A) which has three distinct parts:

1. A top section (8) which serves as the "anchoring" element, for stabilizing the device within the vagina,
- 20 2. A bottom section (10) which serves as the "supporting" element, generating mid-urethral support,
3. An intermediate section (9) which connects top & bottom elements. Along its longitudinal axis, there is a central tunnel (11) which allows for the passage of the extending insert.

25 Each element of the device (FIG 1A+B+C) has 4 flexible arms. These arms of the anchoring element (8), force the device to remain in situ within the vagina, unable to move inwards or outwards, or to rotate. This occurs as a result of the special tendency of vaginal walls to collapse and form an occluded lumen. The flexible arms of the device cause "tenting" of the walls on top of them with resultant sagging of the walls around the  
30 intermediate section, thereby stabilizing the device. The arms of the supporting element

(10) cause elevation of the tissues around mid-urethra, acting as a hammock. This hammock supports mid-urethra in a tension free manner, much like the TVT operation.

The support element has between its arms an extender (FIG 2A+B+C) which is a separate unit. This extender has two distinct parts: the tucker (14) with its enlarged arrow head (15), arising from the flat bottom plate (12). This flat plate is made of flexible material (such as silicone, polyurethane, etc) which enables easy folding into the applicator. The tucker is forcefully pushed into the central tunnel, thereby allowing for its anchoring to the device.

In its resting position (FIG 3A), the extender does not influence expansion of the arms.

The plate is within the space between the arms, without changing dimensions of the support element. FIG 3B shows the same device after forward pushing of the extender. The plate is now much closer to the intermediate section of the device, thereby forcefully spreading the arms, enlarging the diameter of the supporting element. This is essential for creating a device with changing dimensions for treating patients with various vaginal sizes.

The plate has another distinct feature, besides changing diameters. It also serves as a support element for the arms, mainly when a larger diameter is needed, to negate the forces from the vaginal walls.

The tucker may be pushed in to different depths along the central canal, thereby allowing for a wide range of diameters of the support element. The wider arrow head ensures a secured placement due to its wider diameter.

The device and the extending unit will be assembled together and introduced into the cover (FIG 4).

The cover (FIG 4A) is made of a flexible smooth mesh material (17) designed as small sack with a string (18). FIG 4B shows the device (20) within the tightly closed mesh cover (22). The cover allows for:

- Reduction of the friction between vagina and the device during insertion & removal.
- Reduction of the friction between the applicator and the device during insertion.
- Pulling the string causes straightening of the cover, straightening of the vaginal walls, allowing for an easy and smooth removal of the device from the vagina.

- Pulling the string causes the arms to fold slightly towards the midline, thereby reducing its size, allowing for an easy and smooth removal of the device from the vagina.
- The mesh of the cover, being stretched between the arms of the device, also serve as a hammock. In a woman who leaks urine during a stressful event (when abdominal pressure rises during coughing, sneezing, etc.), the urethra sags down but meets the hammock in its mid part. That also causes an elevation of the intra urethral pressure with resultant urinary continence.

The applicator serves for insertion of the device into the vagina (FIG 5), as is done when inserting a regular menstrual tampon. The device is kept within the wider part (26) that is inserted into the vagina. When pushing the plunger (28), the device is pushed through the flower like opening (24), allowing for its immediate action once the applicator is removed from the vagina. The string (32) is visible, protruding out of the opening of the plunger (30).

When the device is still within the applicator (FIG 6), its flexible arms (34) converge towards the midline, allowing for the small dimensions and its insertion via a small diameter applicator. After insertion (FIG 7), the flexible arms of the device gain their pre-intended tension, enlarge the diameter of the device (46) within the vagina (48), anchoring itself under the bladder (40) between the uterine cervix (36) and the pubic bone (38), supporting mid-urethra (42). The string protrudes out of the vaginal introitus (44), as with the regular menstrual tampon, allowing for removal.

The invention has in its basic concept the following features:

- Being a disposable device.
- Insertion of the device is always with an applicator.
- Easy & comfortable insertion and removal.
- 5      • Being comfortable to wear.
- Being hygiene & odorless
- Being a familiar procedure to most female patients – as inserting a menstrual tampon.
- 10      • Being inserted by the patient herself, in a no-self-touch technique, with a disposable inserter.
- Being removed by the patient herself, in a no-self-touch technique, with the device collapsing and becoming of small size for painless removal.
- Being of high availability, easy to get everywhere, sold as an Over the Counter (OTC) device.
- 15      • Being of low cost.
- Having complete confidentiality, as with the use of menstrual tampons.
- Having the ability to be removed instantly when needed.
- No blockage of vaginal discharge.
- Wide range of diameters

**Alternative embodiments of the invention.**

- It may be manufactured in different sizes
- It may be made of many flexible materials, such as silicone, polyurethane, etc.
- 25      • It can have more or less than 4 arms.
- The angle between the arms may be changed.
- There might be different shapes and curves of the arms

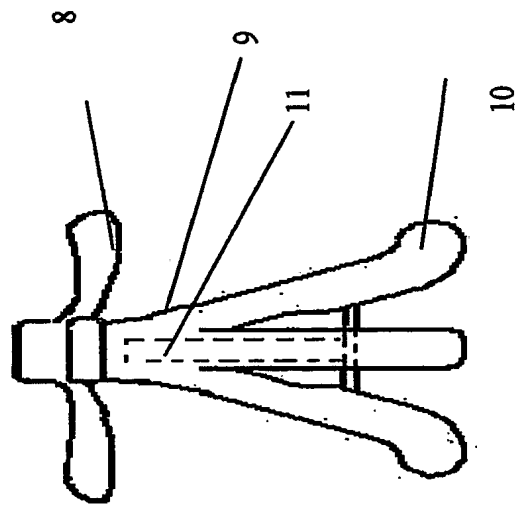


FIG. 1A

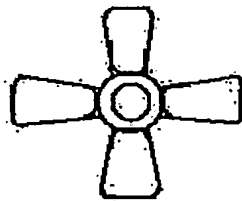


FIG. 1B

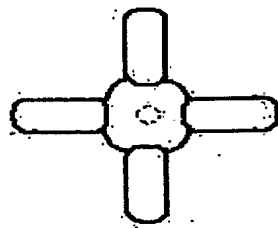


FIG. 1C

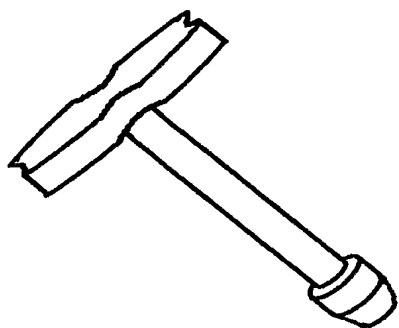


FIG. 2B

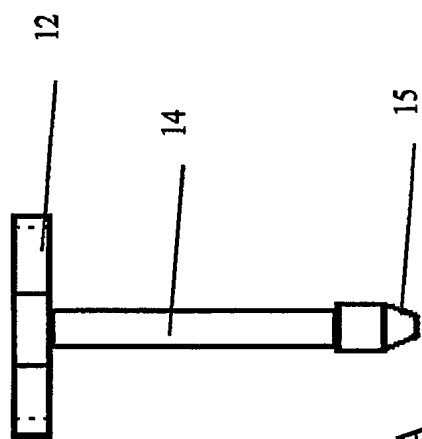


FIG. 2A

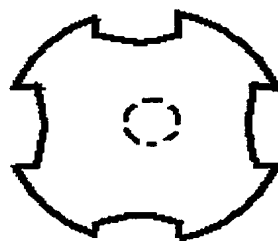
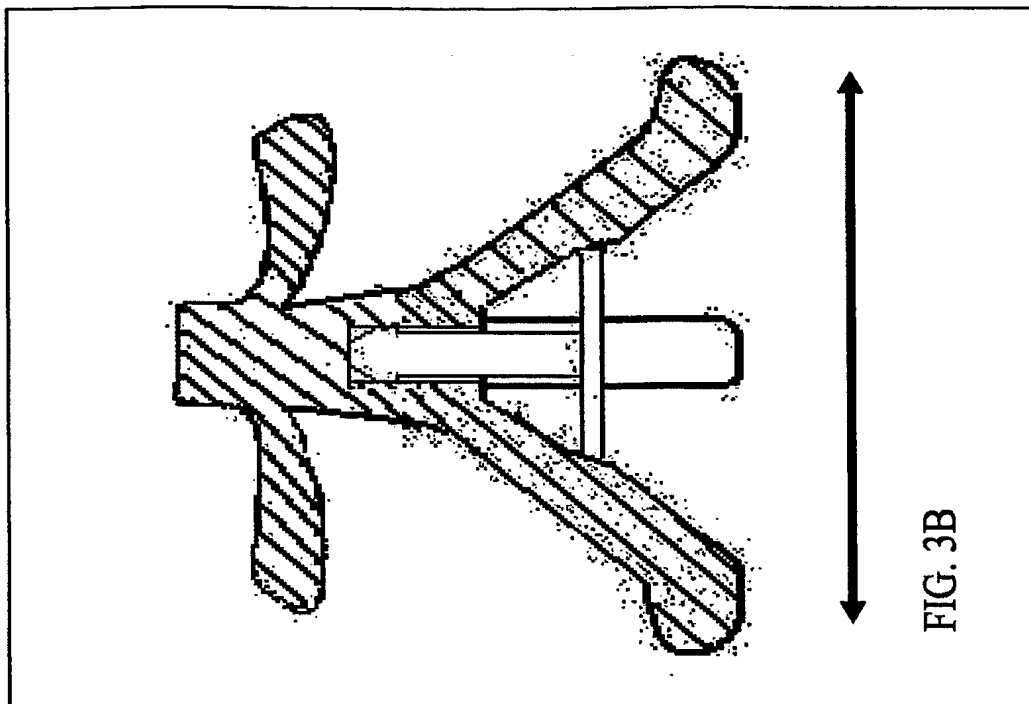
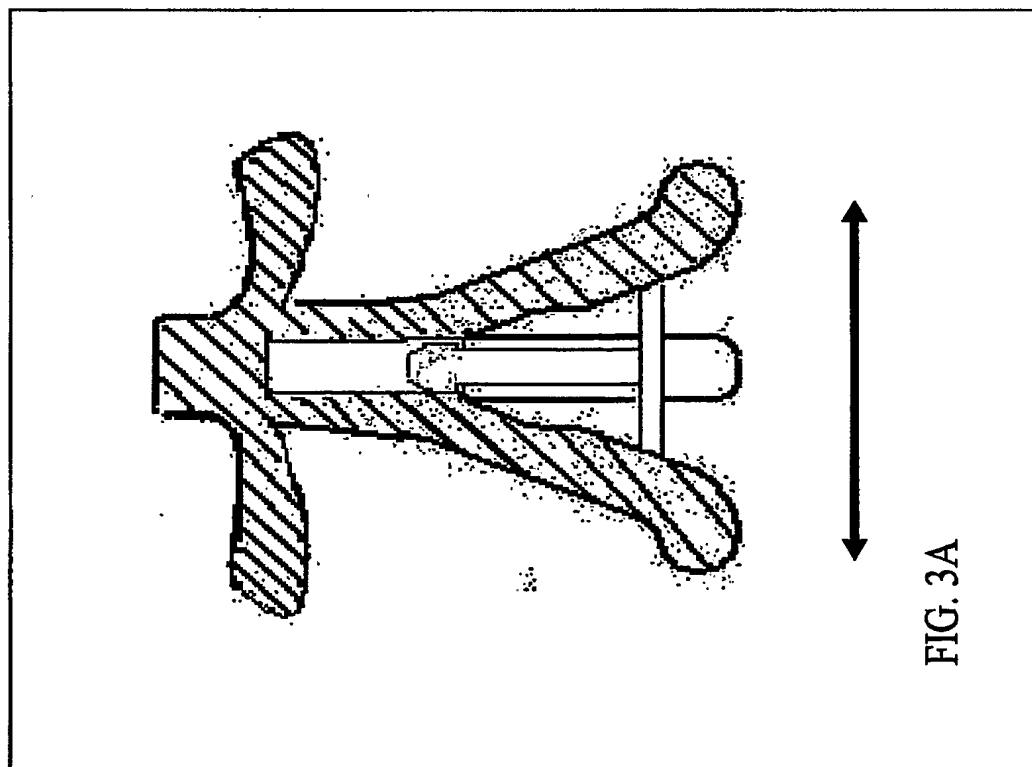


FIG. 2C



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Page 3 of 7

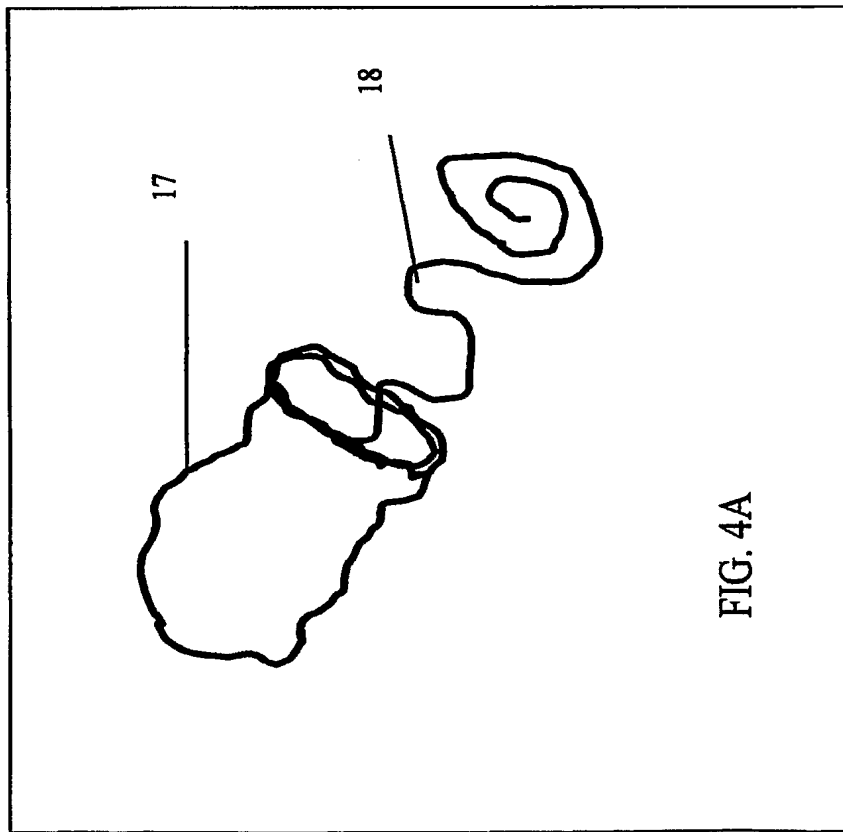


FIG. 4A

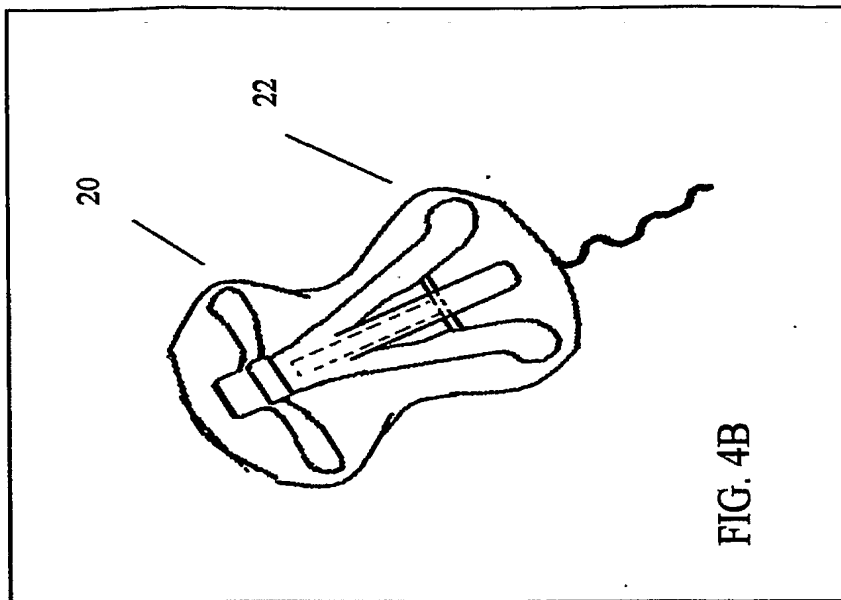
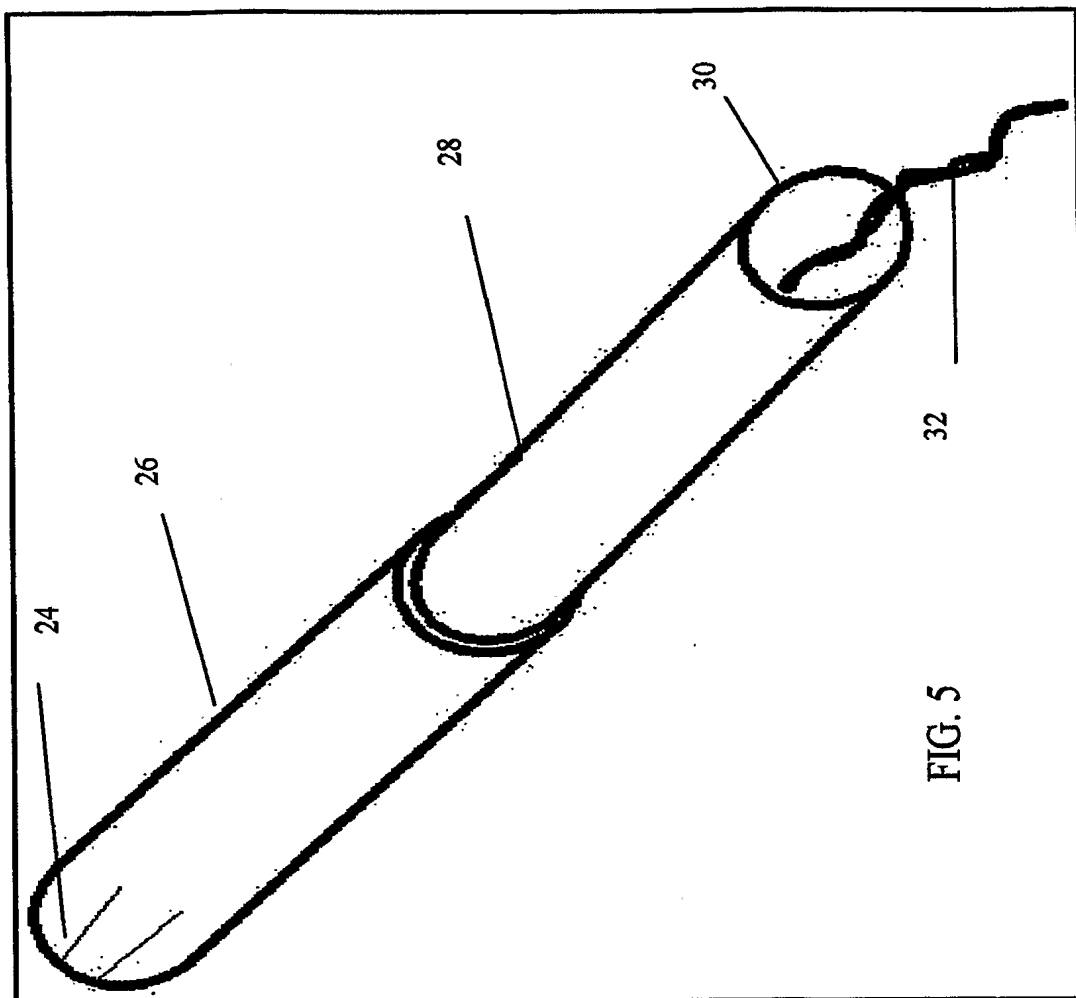


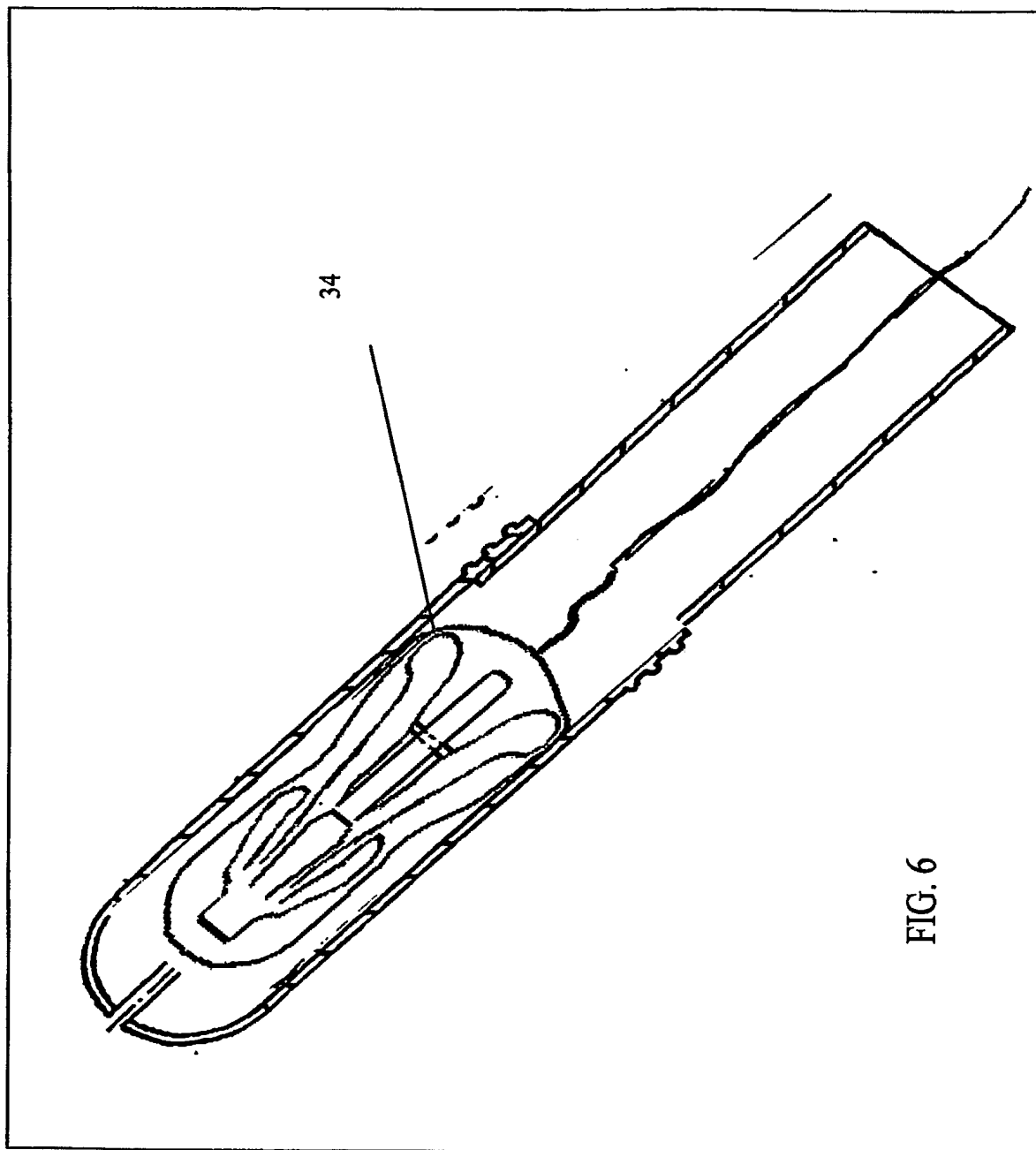
FIG. 4B





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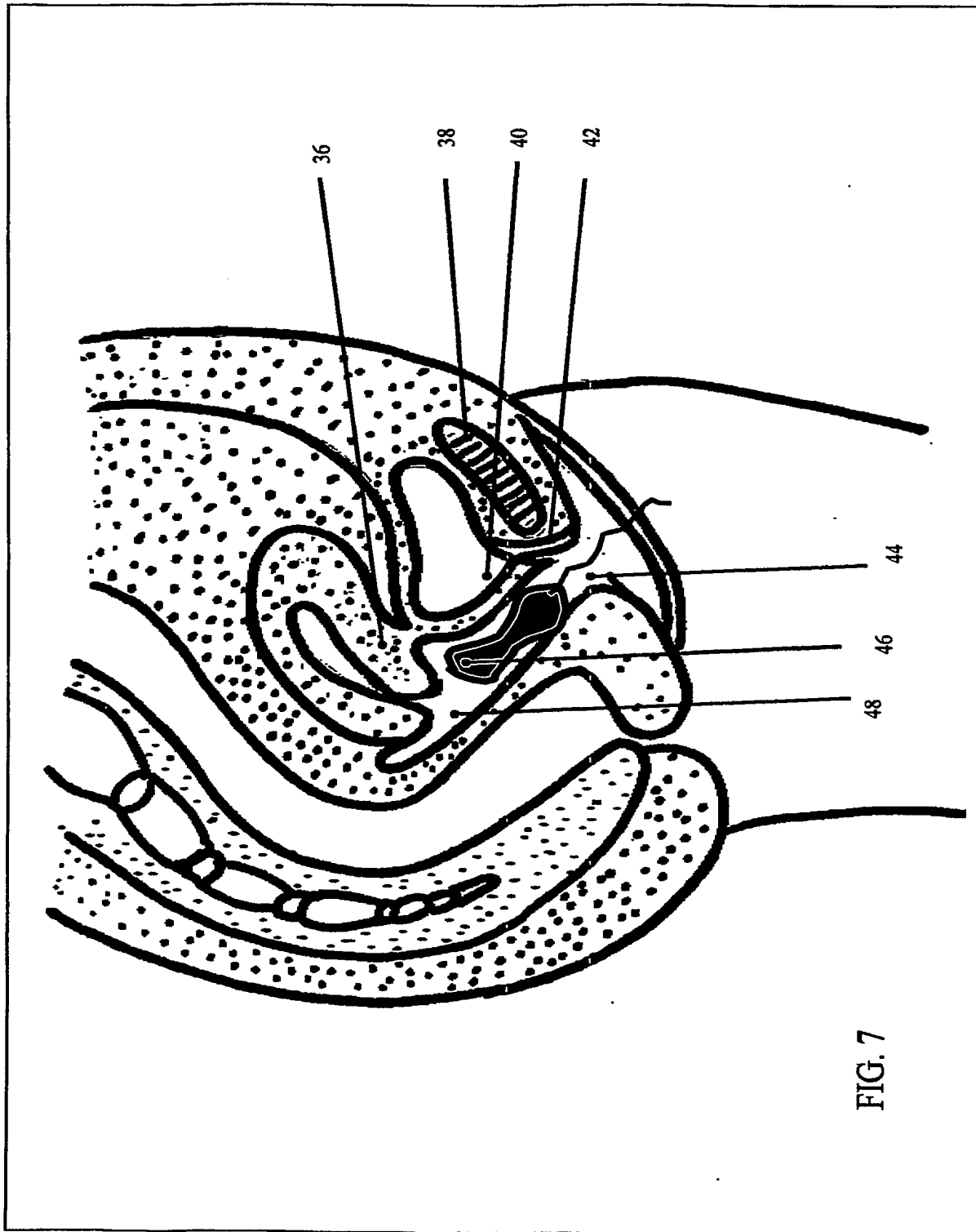
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Page 6 of 7



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Page 7 of 7